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EXAMINER
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HUPCZEY, JR, RONALD JAMES

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3739

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/550,235	<b>Applicant(s)</b> CHIU ET AL.	
	<b>Examiner</b> RONALD HUPCZEY, JR	<b>Art Unit</b> 3739	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) 25-45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/23/05, 8/20/07, 7/13/09</u> . | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. Applicant's preliminary amendment dated September 23<sup>rd</sup>, 2005 is acknowledged.

Currently claims 1-45 are pending. The following is a complete response to the September 23<sup>rd</sup> communication.

#### ***Election/Restrictions***

2. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-24, drawn to a microwave antenna for medical ablation.

Group II, claim(s) 25-44, drawn to a method of making a microwave antenna.

Group III, claim(s) 45, drawn to a method of controlling the depth to width ratio of a lesion.

3. The inventions listed as Groups I, II and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of a microwave antenna for medical ablation comprising an energy emitting antenna element with an inner conductor and a surrounding sheath of insulation located at the end of a transmission line and further comprising a conductive cap at the distal end of the antenna element, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of at least Ito et al (US Pat. No. 5,026,959) in figure 1. Ito et al provides for a transmission line (3) and an energy emitting antenna element (11) with an inner conductor (1), a sheath of insulation (2) and a conductive cap (5) at the distal end of the antenna element.

Similarly, Groups I and III and Groups II and III lack unity of invention because even though the inventions of these groups require the technical feature of a microwave ablation device comprising an antenna, this technical feature is not a special technical feature as it does not make a contribution over the prior art in view of at least Ito et al (US Pat. No. 5,026,959) in figure 1. Ito et al provides for microwave device comprising an antenna as shown as element (11) in figure 1.

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4. During a telephone conversation with F. William McLaughlin on 03/11/2010 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-24. Affirmation of this election must be made by applicant in replying to this Office action. Claims 25-45 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained.

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Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b). Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

### ***Drawings***

7. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the Teflon sheath surround at least the antenna element (claim 20), the catheter (claim 21) and the temperature sensor (claim 22) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet”

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pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

8. The use of the trademark "TEFLON" has been noted in this application. It should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

### ***Claim Objections***

9. Claims 10, 15-16 and 19 are objected to because of the following informalities:

Regarding claim 10, it is suggested that Applicant add "the" before "outer conductor" in line 2 of the claim to enhance the clarity of the claim.

In claim 15, a space should be inserted such that "claim12" reads "claim 12" and in claim 19, a space should be inserted such that "claim18" reads "claim 18".

Again, in claim 15, lines 2-3 read "towards the tip of the antenna makes a forward firing antenna". This should be amended to read "toward the tip of the antenna thereby making a forward firing antenna" in order to fix the grammatical error present.

In claim 16, lines 2-3 read "towards the tip of the antenna makes a reverse firing antenna". This should be amended to read "toward the tip of the antenna thereby making a reverse firing antenna" in order to fix the grammatical error present.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the claim currently recites both an inner conductor of the transmission line and an inner conductor of the antenna element. Lines 7 and 8 currently recite "the inner conductor" and it is unclear as to which inner conductor this is referring to, the one of the transmission line or the one of the antenna element. It is suggested for the sake of clarity that these two inner conductors be clearly delineated by, for example, different names, and that such a delineation be kept consistent throughout the claims. Claims 2-24 are rejected due to their dependency on claim 1. Appropriate correction is required.

Regarding claim 2, "the length of the cap" and "the radius of the cap" and there is insufficient antecedent basis for such limitations in the claim. Appropriate correction is required.

Regarding claim 3, claim 1 sets forth that the antenna has "an inner conductor electrically coupled to the inner conductor of the transmission line" and further recites that "a conducting cap is electrically connected to the distal end of the inner conductor". In light of these limitations, it is unclear how if claim 1 requires the antenna element to have an inner conductor and for the inner conductor of the antenna element to have the cap attached to its distal end, the antenna element can then be built into the end of the transmission line such that the cap is fixed to the inner conductor of the transmission line. From the Examiner's best understanding of claim 3, it

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would appear as if the claim was removing, making integral or making optional the inner conductor of the antenna element. Appropriate correction is required. Claims 4-6 are rejected due to their dependency on claim 3.

Regarding claim 5, the claim currently recites “a shorter length of the dielectric insulator”. This limitation is unclear, however, since the term “shorter” has not been related to any other portion of the device. It is unclear as to what the length is shorter than therefore rendering the scope of the claim indefinite. Appropriate correction is required. Claim 6 is rejected due to its dependency on claim 5.

Regarding claim 8, the claim currently recites that “the antenna element comprises insulating and conducting rings ...”. This is unclear, however, in light of parent claim 7 which sets forth that the antennal element is "configured with conducting rings". It is unclear if the conducting rings of claim 8 are the same as the conducting rings of claim 7 or refer to a different set of conducting rings. Additionally, it is unclear if the insulating rings of claim 8 are used to form the slots of claim 7 or define a separate portion of the antenna element. Claim 9 is rejected due to its dependency on claim 8. Appropriate correction is required.

Regarding claim 9, the claim currently sets forth “the width(s) of the conducting rings”, “the width(s) of the slots” and “the length of the antenna element...”. There is insufficient antecedent basis for such limitations in the claim. Appropriate correction is required.

Regarding claims 12-16, claim 12 currently recites “the conducting rings” and "the slots" therein. There is insufficient antecedent basis for such limitations. Claims 13-16 are rejected due to their dependency on claim 12. Appropriate correction is required.



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Regarding claim 17, the claim currently recites “by the size of the insulator surrounded by the cap” in lines 2-3 of the claim. This is unclear and confusing since claim 1 sets forth that the cap “surrounds a length of the sheath of the insulator”. It is suggested that Applicant amend claim 17 to be inline with the structure set forth in claim 1, namely changing the “size” to the “length” and changing the “insulator” to the “sheath of the insulator” to enhance the clarity of the claim and correct the lack of antecedent basis currently present. Appropriate correction is required.

Regarding claim 19, the current limitations lack antecedent basis: “the straight length ...”, “the radius of bending...”, “the perpendicular distance...”, “the radius of the open loop”, “the length...” and the 2<sup>nd</sup> “the perpendicular distance...”. Appropriate correction is required.

Regarding claims 23 and 24, each claim currently sets forth “the microwave generator”. There is insufficient antecedent basis for such a limitation in each claim. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-13 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al (US Pat. No. 5,026,959).

Regarding claim 1, Ito discloses a microwave antenna for medical ablation (see at least figure 1) comprising a transmission line (cable **10**) having an inner conductor (inner conductor

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**1**), an outer conductor (outer conductor **3**) and a dielectric insulator (dielectric **2**) to provide insulation between the inner and outer conductor. Ito further discloses an energy emitting antenna element (second cable **11**) positioned at the distal end of the transmission line to transmit a microwave near-field (see figure 1) wherein the antenna element has an inner conductor (inner conductor **1** of cable **11**) electrically coupled to the inner conductor of the transmission line and a sheath of dielectric insulator around the inner conductor (dielectric **2** of cable **11**) and wherein a conducting cap (cap **5**) is electrically connected to the distal end of the inner conductor (see figure 1) such that the cap surrounds a length of the sheath of insulator (as seen in figure 1) and the dimensions of the cap are determined to provide impedance matching between the antenna element and the transmission line (see col. 3; 3-14 and claim 7).

Regarding claim 2, Ito discloses that at least one of the particular dimensions of the metallic cap listed in claim 2 are determined in order to form the cap **5**. It is noted by the Examiner that the limitation of “determined” is rather broad when taken in combination with the various length and radius dimensions. In the broadest reasonable interpretation and as is being applied by the Examiner, if the dimension of the prior art device exists, it is therefore being taken as being determined. In the instance case, it is clear that the cap **5** as in figure 1 has a length as well as a radius and surrounds a length of the sheath of insulator. The same standard will be applied for the remaining claims.

Regarding claim 3, Ito discloses that the antenna element is built into the end of the transmission line, and the cap is fixed to the inner conductor of the transmission line (see figure 1, cables **10** and **11** joined; placement of cap **5** in relation to inner conductor **1**).

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Regarding claim 4, Ito discloses that a first length of the outer conductor is removed from the distal end of the transmission line to create the antenna element (see at least figure 1).

Regarding claim 5, Ito discloses that a shorter length of the dielectric insulator is removed from the distal end to expose a length of the inner conductor for fixing of the cap (see figure 1, inner conductor **1** within cap **5**).

Regarding claim 6, Ito discloses that the length of exposed inner conductor between the distal end of the sheath of insulator and the cap is determined (see figure 1).

Regarding claim 7, Ito discloses that the antenna element is configured with conducting rings (ring conductors **4**) spaced apart from each other along its length by slots (slits **7**).

Regarding claim 8, Ito discloses that the antenna element comprises insulating and conducting rings placed alternately along the length of insulating sheath (ring conductors **4** separated by slits **7**).

Regarding claim 9, Ito discloses that one or more of the following dimensions: the width (s) of the conducting rings, the width (s) of the slots and the length of the antenna element between the end of the outer conductor and the cap are determined (see figure 1 and col. 4; 32-34).

Regarding claim 10, Ito discloses that the conducting rings comprise rings of outer conductor (ring conductors **4** with same diameter as outer conductor **3**).

Regarding claim 11, Ito discloses that the cap is made using a conducting ring (cap **5** disclosed as conducting).

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Regarding claim 12, Ito discloses that the sizes of the conducting rings and the slots between them are selected to determine the shape of the near-field distribution (see col. 4; 59-68).

Regarding claim 13, Ito disclose that the conducting rings are the same size, and all the slots between them are the same size (see spacing in figure 1 and see claim 2).

Regarding claim 16, Ito discloses that the slot and ring sizes gradually decrease towards the tip of the antenna thereby making firing antenna (see claim 5).

Regarding claim 17, Ito discloses that the dielectric loading produced by the size of the insulator surrounded by the cap is determined to ensure the near field flow terminates at the tip of the antenna rather than at the transmission line/antenna element junction (see col. 5; 1-8).

### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959).

Regarding claim 14, Ito fails to specifically recite that the conductive rings are twice as wide as the slots between them. However, Ito does disclose that the slots (slits 71) and the rings (ring conductors 4) are adjustable in size and that such an adjustment allows for the antenna to match the desired microwave treatment frequency (see col. 4; 32-34). Ito also discloses that any of the plurality of measurements of the rings and slots can be adjusted (see col. 4; 54-64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the rings twice as wide as the slots between them to obtain a desired treatment depth with respect to the desired treatment frequency. While Applicant has set the desired measurement relation on at least pages 5 and 11 of the specification, much of the disclosure is directed towards adjusting the respective measurements to find optimal widths. No criticality or unexpected results have been set forth by Applicant with respect to the claimed measurements. Additionally, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

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Regarding claim 15, Ito fails to disclose that the slot and ring sizes gradually increase towards the tip of the antenna makes a forward firing antenna. Ito does disclose, with respect to claim 16 above, that the sizes gradually decrease towards the tip. Additionally, Ito discloses that the slots (slits **71**) and the rings (ring conductors **4**) are adjustable in size and that such an adjustment allows for the antenna to match the desired microwave treatment frequency (see col. 4; 32-34). Ito also discloses that any of the plurality of measurements of the rings and slots can be adjusted (see col. 4; 54-64). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to increase the size of the slots and rings gradually in order to obtain a desired treatment depth with respect to the desired treatment frequency. While Applicant has set the desired measurement relation on at least page 14 of the specification, much of the disclosure is directed towards adjusting the respective measurements to find optimal widths. No criticality or unexpected results have been set forth by Applicant with respect to the claimed measurements. Additionally, it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

18. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959) as applied to claim 1 above, and further in view of Chin et al (US Pat. No. 6,802,840).

Regarding claim 18, Ito fails to disclose that the antenna element is configured by being bent to form an open loop oriented such that it extends transverse to the longitudinal axis of the transmission line. Chin discloses a microwave treatment device in which the antenna element is bent to form an open loop transverse to the longitudinal axis of the transmission line (see figure

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12) in order for the device to better conform to the desired target treatment surface (see col. 8; 31-39). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to shape the device of Ito in the open loop shape of Chin in order to better form desired lesion patterns. Such an open loop shape prevents the inadvertent and undesired treatment of non-target tissue and allows for circular lesions to be formed around, for example, the pulmonary vein of the heart.

Regarding claim 19, as with claim 18 above, the open loop form of the antenna element is being taught by Chin. In order to form the open loop, at least one of the dimensions of: the straight length of the sheath of insulator before bending begins, the radius of bending between the transmission line and the open loop, the perpendicular distance between the open loop and the beginning of bending, the radius of the open loop, the length the cap not surrounding the sheath of insulator and the perpendicular distance between the top of the cap and the transmission line would need to be determined. As such, it is the Examiner position that in view of the combination of Ito in view of Chin, that at least one of the above dimensions would be an obvious consideration. It is again noted by the Examiner that the limitation of “determined” is rather broad when taken in combination with the various length and radius dimensions. In the broadest reasonable interpretation and as is being applied by the Examiner, if the dimension of the prior art device exists, it is therefore being taken as being determined.

19. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959) as applied to claim 1 above, and further in view of Edwards et al (US Pat. No. 6,033,401).

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Regarding claim 20, Ito discloses that the antenna comprises a sheath surrounding at least the antenna element (protective layer **9**) but fails to disclose the material of construction to be Teflon. Edwards discloses a microwave treatment device (see figure 1) in which the elongate body **12** is coated with a Teflon coating (see col. 5; 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the protective layer **9** of Ito out of Teflon to provide for a device which has a reduced chance of sticking to the surrounding treated tissue. It is further noted that the use of Teflon to coat devices, as demonstrated by Edwards, is well known and commonly utilized in the art.

20. Claims 21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959) as applied to claim 1 above, and further in view of Elliott (US Pat. No. 4,800,899).

Regarding claim 21, Ito fails to disclose that the antenna element is delivered to an ablation site by feeding the transmission line through a catheter. Elliott discloses a similar microwave antenna as that of Ito and discloses in figure 5 that the antenna is delivered through a catheter (catheter **73**). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to size the antenna of Ito to a diameter suitable for insertion through a catheter. It is noted that the use of a catheter to insert a treatment device is old and well known in the art and one of ordinary skill would readily appreciate the insertion of a microwave antenna in this manner.

Regarding claim 24, Ito fails to disclose a computer control system to monitor or the ablation process and control the microwave generator. Elliott discloses a similar microwave antenna as that of Ito and further discloses the present of a computer control system (see figure 1,



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apparatus **10**) which controls the microwave generator (generator **14**) and monitors the ablation process (by use of sensors **42**). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the computer control system of Elliott with the antenna of Ito to provide a well known manner of controlling the application of microwave energy to the target treatment site.

21. Claims 22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959) as applied to claim 1 above, and further in view of Kasevich (US Pat. No. 5,057,106).

Regarding claim 22, Ito fails to disclose that the antenna comprises a temperature sensor to sense the temperature of the tissue. Kasevich discloses a microwave treatment system comprising an antenna (array **12**) containing at least one temperature sensor (sensors **29**, **31**, **33** and **35**) for sensing temperature. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a temperature sensor of Kasevich in combination with the antenna of Ito to provide for a combined device which can relate tissue temperature to a user. The provision of such ensures that the target tissue is heated in excess thereby reducing the chance of burning or charring of tissue and effectively limiting overall lesion size.

Regarding claim 24, Ito fails to disclose a computer control system to monitor or the ablation process and control the microwave generator. Kasevich discloses a similar microwave antenna as that of Ito and further discloses the present of a computer control system (Systems **s1** and **s2**) which controls the microwave generator and monitors the ablation process (by use of sensors **29**, **31**, **33** and **35**). Therefore, it would have been obvious to one of ordinary skill in the

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art at the time the invention was made to utilize the computer control system of Kasevich with the antenna of Ito to provide a well known manner of controlling the application of microwave energy to the target treatment site.

22. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al (US Pat. No. 5,026,959) in view of Kasevich (US Pat. No. 5,057,106) as applied to claim 22 above, and further in view of Elliott (US Pat. No. 4,800,899).

Regarding claim 23, Ito and Kasevich fail to specifically recite a microwave generator delivering energy at 2.45 GHz. Elliott discloses that the application of microwaves at 2450 MHz (2.45GHz) is common by generators known in the art (see col. 4; 37-46) and that such is advantageous because it is an FCC approved frequency (see col. 6; 50-62). Therefore, it would have been obvious to utilize a well known microwave generator such as that disclosed in Elliott in combination with the antenna of Ito to provide for a device which provides an exemplary and commonly utilized frequency of microwave energy to a target treatment site.

### ***Conclusion***

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Rudie (US 5,776,176), Grundy (US 5,405,346), Langberg (US 5,246,438), Warner (US 5,364,392), Seifert (US 3,230,957), Fetter (US 4,841,988).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RONALD HUPCZEY, JR whose telephone number is (571)270-5534. The examiner can normally be reached on Monday - Friday, 9 A.M. to 5 P.M..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda Dvorak can be reached on 571-272-4764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Ronald J. Hupczey/  
Examiner, Art Unit 3739

/Michael Peffley/  
Primary Examiner, Art Unit 3739

RJH